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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/595,778	06/16/2000	Michael Grimbergen	AMAT/2077.D1	6490

7590

04/24/2002

Patent Counsel
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EXAMINER

OLSEN, ALLAN W

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 04/24/2002

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/595,778

Examin r

Allan W. Olsen

Applicant(s)

GRIMBERGEN ET AL.

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 26-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-25, drawn to a method of processing substrates, classified in class 216, subclass 063.
- II. Claims 26-32, drawn to a substrate processing apparatus, classified in class 156, subclass 345.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as apparatus and product made. The inventions in this relationship are distinct if either or both of the following can be shown: (1) that the apparatus as claimed is not an obvious apparatus for making the product and the apparatus can be used for making a different product or (2) that the product as claimed can be made by another and materially different apparatus (MPEP § 806.05(g)). In this case the apparatus could be used to as a spectrophotometer or to monitor a liquid phase reaction.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Ashok Janah on 4/15/2002 a provisional election was made with traverse to prosecute the invention of group I, claims 1-25. Affirmation of this election must be made by applicant in replying to this Office action. Claims 26-32 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim --Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-7, 10 and 12-16 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 5,770,097 issued to O'Neill et al. (hereinafter, O'Neill).

O'Neill teaches a method of monitoring a plasma process conducted upon a substrate. The substrate processing method of O'Neill an antenna, positioned over the ceiling of the apparatus, is used to inductively couple RF energy into the apparatus thereby exciting the gases within the chamber into a plasma. Furthermore, the method of O'Neill spectroscopically monitors the plasma processing of the substrate. The

Art Unit: 1746

spectroscopic monitoring uses standard spectrophotometer components, such as: optical fiber; signal source; signal detector, and collimating lens. See: figure 1; column 4, line 45 – column 5, line 10.

Claims 1-7 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 5,846,883 issued to Moslehi.

Moslehi teaches a method of processing a substrate in an inductively coupled RF plasma chamber. RF power is inductive coupled into the chamber by means of an antenna placed above the chamber's ceiling. Moslehi teaches spectroscopically monitoring the plasma process by providing both a source and a detector of optical energy, the energy being transmitted through a window in the chamber's ceiling. See: figures 1 and 22; column 4, lines 33-53; column 12, lines 23-33; column 7, lines 10-18; column 23, lines 43-48.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8, 9, 11 and 17-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Neill in view of U.S. Patent 5,691,540 issued to Halle et al. (hereinafter, Halle).

As noted in the above 102 rejection, O'Neill teaches the limitations of claims 1-7, 10 and 12-16, various permutations of which appear in claims 8, 9, 11 and 17-25.

O'Neill does not teach that the spectrophotometer includes a bifurcated optical cable with end being connected to the signal source and one end being connected to the signal detector. O'Neill does not teach having an optical window in the chamber's ceiling. O'Neill does not teach the placing the monitoring assembly within a second enclosure. O'Neill does not teach a chamber having a domed ceiling.

Halle teaches the a plasma process monitoring apparatus that includes a collimating lens and a bifurcated optical cable with end being connected to the signal source and one end being connected to the signal detector. See: abstract; figure 1; column 2, lines 11-33 column 3, lines 2-11 and 39-40.

The above noted limitations that O'Neill fails to teach are all apparatus limitations recited within method claims. Apparatus limitations, unless they affect the process in a manipulative sense, are afforded little weight in process claims¹. Nevertheless, it would be obvious to one skilled in the art to incorporate the apparatus of Halle into the method of O'Neill because Halle teaches that the assembly is compact and inexpensive and the design provides significant advantages, such as, providing the ability to measure the trench depth of features having a lateral dimension of less than 0.5 μm .

Claims 8-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi in view of Halle.

As noted in the above 102 rejections Moslehi teaches the limitations of claims 1-7. Various permutations of these limitations are found in claims 8-25. Additionally, Moslehi teaches having the antenna embedded within the ceiling. Moslehi teaches that

the coil configuration of the antenna allows for the surface of the dielectric antenna housing to be contoured, i.e. domed (column 2, lines 13-17).

Moslehi does not teach the antenna covers an external portion of the ceiling. Moslehi does not teach that the full wafer interferometry sensor includes a bifurcated optical cable with end being connected to the signal source and one end being connected to the signal detector. Moslehi does not teach the placing the monitoring assembly within a second enclosure.

Halle teaches the a plasma process monitoring apparatus that includes a collimating lens and a bifurcated optical cable with end being connected to the signal source and one end being connected to the signal detector.

The above noted limitations that Moslehi fails to teach are all apparatus limitations recited within method claims. Apparatus limitations, unless they affect the process in a manipulative sense, are afforded little weight in process claims¹. Nevertheless, it would be obvious to one skilled in the art incorporated apparatus of Halle into the method of Moslehi because Halle teaches that the assembly is compact and inexpensive and the design provides significant advantages, such as, providing the ability to measure the trench depth of features having a lateral dimension of less than 0.5 μm .

¹ *In re Tarczy-Hornoch* 158 USPQ 141, 150 (CCPA 1968); *In re Edwards* 128 USPQ 387 (CCPA 1961); *Stalego v. Heymes* 120 USPQ 473, 478 (CCPA 1959); *Ex parte Hart* 117 USPQ 193 (PO BdPatApp 1957); *In re Freeman* 44 USPQ 116 (CCPA 1940); *In re Sweeney* 72 USPQ 501 (CCPA 1947).

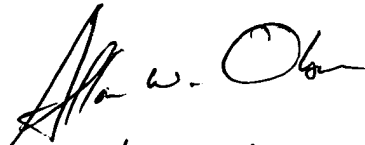
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is (703) 306-9075. The examiner can normally be reached on Monday through Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached on (703) 308-4333. The fax phone number for this Group is (703) 305-7719.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Allan Olsen, Ph.D.
April 16, 2002


Au. 1746